

STUDY OF PARTIAL REPLACEMENT OF SAND USING REPULPED NEWSPAPER

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The majority of abandoned paper waste accumulating from the countries all over the world causes certain serious environmental problems. The high volume of concrete offers a holistic solution to the problem of meeting the increasing demands for concrete in the future in a sustainable manner and at a reduced cost. At the same time, it is necessary to reduce the environmental impact of industries that are vital to economic development. The present study focuses on utilizing the waste materials like wastepaper into cost effective building bricks and recycle the wastepaper without any environmental problem to the surrounding environment and the society. The investigation was carried out to evaluate the strength, durability and structural properties of papercrete building bricks. Then the results were compared with those of conventional bricks. The behavior of papercrete masonry unit was studied and their results were verified with software analysis (ANSYS). The strength and durability of cement composites containing wastepaper have been studied in detail and the optimum mix proportions have been obtained. This optimum mix was considered for casting the papercrete bricks and their properties have been studied. In order to improve the durability property (water absorption) several techniques have been tried and a suitable technique was arrived at for further study of papercrete bricks. The papercrete bricks have been tested for their compressive strength, water absorption, thermal conductivity, sorptivity and acid resistance. The performance of the papercrete has been compared with that of conventional clay bricks. As a final part of the research, the behavior of brick masonry walls has been studied under lateral loading. The results were compared with that of theoretical values predicted by ANSYS software. The thesis concluded that the papercrete bricks are relatively low cost, light weight and more flexible and they are most suitable for earthquake prone areas. This brick does not expand or contract so that the sheets of glass or glass block can be embedded and trimmed with papercrete. However, uncoated bricks are not suitable for water logging and external walls. They can be used in inner partition walls. The uses of papercrete brick masonry not only result in reduced dead load of the structure, it also offers higher ductility and energy characteristics. Therefore, the papercrete bricks are suitable material for earthquake prone areas.